

2 SEMI-ANNUAL MONITORING REPORT

In accordance with Title V Permit Standard Condition I.F and Condition 8366, Part 19, BAAQMD Regulation 8-34-411, and 40 CFR §60.757(f) in the NSPS, this Report is a Combined Title V Semi-Annual and Partial 8-34 Annual Report that is required to be submitted by TCRDF. The report contains monitoring data for the operation of the landfill gas collection and control system (GCCS). The operational records have been reviewed and summarized. The timeframe included in this report is November 1, 2015 to April 30, 2016. The following table lists the rules and regulations that are required to be included in this Combined Report.

Table 2-1 Semi-Annual Report Requirements

RULE	REQUIREMENT	LOCATION IN REPORT
8-34-501.1 §60.757(f)(4)	All collection system downtime, including individual well shutdown times and the reason for the shutdown.	Section 2.1, Appendices B & C
8-34-501.2 §60.757(f)(3)	All emission control system downtime and the reason for the shutdown.	Section 2.2, Appendix B
8-34-501.3, 8-34-507, §60.757(f)(1)	Continuous temperature for all operating flares and any enclosed combustor subject to Section 8-34-507.	Section 2.3, Appendix D
8-34-501.4, 8-34-505, 8-34-510	Testing performed to satisfy any of the requirements of this Rule.	Sections 2.4 & 2.10 Appendices E & G
8-34-501.5	Monthly landfill gas flow rates and well concentration readings for facilities subject to 8-34-404.	Sections 2.5 & 2.11 Appendix J
8-34-501.6, 8-34-503, 8-34-506, §60.757(f)(5)	For operations subject to Section 8-34-503 and 8-34-506, records of all monitoring dates, leaks in excess of the limits in Section 8-34-301.2 or 8-34-303 that are discovered by the operator, including the location of the leak, leak concentration in parts per million by volume (ppmv), date of discovery, the action taken to repair the leak, date of the repair, date of any required re-monitoring, and the re-monitored concentration in ppmv.	Sections 2.6 & 2.7, Appendix F
8-34-501.7	Annual waste acceptance rate and current amount of waste in place.	Section 2.8,
8-34-501.8	Records of the nature, location, amount, and date of deposition of non-degradable wastes, for any landfill areas excluded from the collection system requirement as documented in the GCCS Design Plan.	Section 2.9
8-34-501.9, 8-34-505, §60.757(f)(1)	For operations subject to Section 8-34-505, records of all monitoring dates and any excesses of the limits stated in Section 8-34-305 that are discovered by the operator, including well identification number, the measured excess, the action taken to repair the excess, and the date of repair.	Section 2.10, Appendices G & H

Table 2-1 Semi-Annual Report Requirements (continued)

RULE	REQUIREMENT	LOCATION IN REPORT
8-34-501.10, 8-34-508, §60.757(f)(1)	Continuous gas flow rate records for any site subject to Section 8-34-508.	Section 2.11, Appendices D & I
8-34-501.11, 8-34-509	For operations subject to Section 8-34-509, records of key emission control system operating parameters.	Section 2.2.2
8-34-501.12	The records required above shall be made available and retained for a period of five years.	Section 1.2
§60.757(f)(2)	Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under §60.756.	Section 2.2.1
§60.757(f)(6)	The date of installation and the location of each well or collection system expansion added pursuant to paragraphs (a)(3), (b), (c)(4) of §60.755.	Section 2.12
§60.10 (d)(5)(i)	Startup, Shutdown, Malfunction Events	Section 4, Appendices B & C

2.1 COLLECTION SYSTEM OPERATION (BAAQMD 8-34-501.1 & §60.757(F)(4))

Appendix A contains a map dated November 14, 2014 of TCRDF's existing GCCS. No wells were added to or removed from the collection system during the reporting period.

Appendix B includes all collection system downtimes and the reason for the shutdowns. The information contained in Section 2.1.2 and Appendix C includes the individual well shutdown times and the reason for each shutdown.

2.1.1 COLLECTION SYSTEM DOWNTIME

During the period covered in this report, the landfill gas (LFG) collection system was not shut down for more than five (5) days on any one occasion. Pursuant to BAAQMD Regulation 8-34-113, Limited Exemption, Inspection and Maintenance, the total downtime is summarized below:

Table 2-2 Collection System Downtime

PERIOD	DOWNTIME (HOURS)
January 1, 2015 – December 31, 2015	37.57
January 1, 2016 – April 30, 2016	55.87
November 1, 2015 – April 30, 2016	58.57

A Flare SSM Log that lists dates, times, and lengths of shutdowns for the reporting period is included in Appendix B.

2.1.2 WELL DISCONNECTION LOG

During the reporting period, zero (0) wellfield SSM events occurred. In addition, zero wells (out of a possible 3) remain disconnected at the end of the reporting period, pursuant to BAAQMD Regulation 8-32-116.2 (Limited Exemption, Well Raising).

A Wellfield SSM Log that lists dates, times, and lengths of disconnections for the reporting period is included in Appendix C.

2.2 EMISSION CONTROL DEVICE DOWNTIME (BAAQMD 8-34-501.2 & §60.757(F)(3))

The emission control system consists of the A-3 Enclosed Flare. No bypassing of the control system or emissions of raw LFG occurred. A Flare SSM Log for the A-3 Flare is included in Appendix B. Total downtime is summarized in the following table:

Table 2-3 Flare A-3 Downtime

PERIOD	DOWNTIME (HOURS)
January 1, 2015 – December 31, 2015	37.57
January 1, 2016 – April 30, 2016	55.87
November 1, 2015 – April 30, 2016	58.57

2.2.1 LFG BYPASS OPERATIONS (§60.757(f)(2))

Title 40 CFR §60.757(f)(2) is not applicable at the TCRDF because no bypass line is installed. LFG cannot be diverted from the control equipment.

2.2.2 KEY EMISSION CONTROL OPERATING PARAMETERS (BAAQMD 8-34-501.11 & 8-34-509)

BAAQMD Regulations 8-34-501.11 and 8-34-509 are not applicable to the A-3 Flare because the A-3 Flare is subject to continuous temperature monitoring as required by BAAQMD Regulation 8-34-507 and §60.757(f)(1).

2.3 TEMPERATURE MONITORING RESULTS (BAAQMD 8-34-501.3, 8-34-507, & §60.757(F)(1))

The combustion zone temperature of the flare is monitored with thermocouples and recorded with a Yokogawa paperless chart recorder. There were no continuous recorder device SSM events during the reporting period. As shown in Appendix D, there were no periods of missing temperature data for the flares during the reporting period.

Title V Permit Condition Number 8366 Part 6 states that the minimum combustion zone temperature, averaged over a 3-hour period, shall be equal to the average combustion zone temperature determined during the most recent complying source test minus 50°F,

provided that the minimum combustion zone temperature is not less than 1,450°F. Pursuant to Part 6, the following temperature limits applied during the reporting period:

Table 2-4 Applicable 3-Hour Temperature Limits

Test Date	Report Submitted	Average Temperature During Test (°F)	3-hr Minimum Temperature (°F)
3/5/2015	4/15/2015	1,580	1,530
3/3/2016	4/12/2016	1,594	1,544

2.4 MONTHLY COVER INTEGRITY MONITORING (BAAQMD 8-34-501.4)

The Monthly Cover Integrity Monitoring Reports are included in Appendix E. The cover integrity monitoring was performed on the following dates:

- November 23, 2015
- December 28, 2015
- January 27, 2016
- February 29, 2015
- March 16 and 17, 2016
- April 20, 2016

2.5 LESS THAN CONTINUOUS OPERATION (BAAQMD 8-34-501.5)

The TCRDF does not operate under BAAQMD Regulation 8-34-404 (Less Than Continuous Operation) and therefore is not required to submit monthly LFG flow rates.

2.6 SURFACE EMISSIONS MONITORING (BAAQMD 8-34-501.6, 8-34-506, & §60.757(F)(5))

Quarterly Surface Emissions Monitoring (SEM), pursuant to 8-34-506, occurred during the reporting period on the following dates:

- Fourth Quarter 2015 – October 19 and 20, 2016
- First Quarter 2016 – March 1 and 2, 2016

Flame ionization detectors (FID) were used during the SEM events to monitor the landfill surface according to the SEM Maps. Any areas suspected of having emission issues by visible observation were also monitored. Prior to all monitoring events, the FID used was zeroed and calibrated using zero air and 500 ppmv methane calibration gas.

There were zero (0) locations with exceedances detected during either monitoring event. No corrective actions or follow-up monitoring was required. Copies of the SEM Reports are included in Appendix F.

The TCRDF is a closed landfill as defined by 8-34-223. The Site has also achieved three consecutive quarters with no SEM exceedances. Therefore, the TCRDF may now reduce the frequency of SEM events to annually. The next SEM event is due by March 31, 2016. Any exceedance detected during annual monitoring will required the Site to revert to quarterly monitoring.

2.7 COMPONENT LEAK TESTING (BAAQMD 8-34-501.6 & 8-34-503)

Quarterly Component Leak Testing using FIDs, pursuant to 8-34-503, occurred during the reporting period on the following date:

- Fourth Quarter 2015 – October 20, 2016
- First Quarter 2016 – March 1 and 2, 2016

One component leak was discovered at an isolation valve on March 2, 2016 (2,000 ppm_v). The location was repaired on March 4, 2016 and re-monitored on March 7, 2016 (23 ppm_v).

Quarterly LFG Component Leak Check logs are included with the SEM reports (Appendix F).

2.8 WASTE ACCEPTANCE RECORDS (BAAQMD 8-34-501.7)

The TCRDF is closed and all final closure documentation has been received. No degradable waste was accepted during the reporting period. The total waste in place is 12.77 million tons.

2.9 NON-DEGRADABLE WASTE ACCEPTANCE RECORDS (BAAQMD 8-34-501.8)

TCRDF does not have non-degradable waste areas that are excluded from the collection system. Therefore, BAAQMD Regulation 8-34-501.8 is not applicable.

2.10 WELLHEAD MONITORING DATA (BAAQMD 8-34-501.4 & 8-34-505)

Wellhead monitoring was performed on a monthly basis pursuant to 8-34-505. The wellhead concentration readings for the reporting period are included in Appendix G. Each well was monitored in accordance with the following requirements:

- 8-34-305.1 - Each wellhead shall operate under a vacuum.
- 8-34-305.2 - The LFG temperature in each wellhead shall be less than 55 degrees Celsius (°C) (131°F).
- 8-34-305.4 - The oxygen (O₂) concentration in each wellhead shall be less than 5 percent by volume.

The wellhead monitoring was performed on the following dates:

- November 18, 18, 20, 23, and 25, 2015

- December 3, 2015
- January 27, 2016
- February 15 and 29, 2016
- March 1, 4, 16, 17, 18, 19, 29, and 31, 2016
- April 12, 13, 18, 19, 20, 26, and 29, 2016

Wellhead Deviations (BAAQMD 8-34-501.9 & §60.757(f)(1))

Wellfield deviations from BAAQMD Regulation 8-34-305 during the reporting period are summarized in Table 2-5. The Wellfield Deviation Log is attached in Appendix H.

Table 2-5 Wellfield Deviation Summary

Well ID	Exceedance Date	Exceedance Value	Re-monitoring Date	Compliance Date and Reading	Days in Exceedance
TRIC0228	11/18/15 11:01	6.8% O ₂	11/18/15 11:03	11/18/15 4.6% O ₂	<1
TRIC0230	11/23/15 11:03	5.6% O ₂	11/23/15 11:05	11/23/15 3.2% O ₂	<1
TRIC0228	12/3/15 12:21	7.0% O ₂	12/3/15 12:27	12/3/15 4.7% O ₂	<1
TRIC0228	1/27/16 11:26	8.3% O ₂	1/27/16 11:29	1/27/16 4.6% O ₂	<1
TRIC0228	2/29/16 10:49	7.8% O ₂	2/29/16 11:02	2/29/16 0.0% O ₂	<1
TRIC0201	3/16/16 12:53	0.1" H ₂ O	3/16/16 12:53	3/16/16 -0.01" H ₂ O	<1
TRIC0203	3/16/16 13:26	0.2" H ₂ O	3/17/16 13:24	3/16/16 -0.02" H ₂ O	1

% – percent O₂ – oxygen

2.11 GAS FLOW MONITORING RESULTS (BAAQMD 8-34-501.10, 8-34-508, & §60.757(F)(1))

Flow is measured using a Kurz flow meter installed on March 12, 2015. The LFG flow is displayed and digitally recorded with a General Electric data panel and Yokogawa Digital Recorder, which records flow every two minutes. The flow data readings are saved to a compact flash card. The flow meter is maintained and calibrated pursuant to the manufacturer's recommendations. The flare flow meter meets the requirements of BAAQMD Regulation 8-34-508 by recording at least every 15 minutes. The flow records for the flare are available for review at the TCRDF. As shown in Appendix D, no flare temperature or flow deviations occurred from November 1, 2015 to April 30, 2016.

Title V Permit Condition Number 8366, Part 11 limits daily heat input to 1,800 Million British thermal units (MMBTU) per day and annual heat input to 657,000 MMBTU. Table 2-6 below is a summary of the total LFG flow for the reporting period of November 1, 2015 to April 30, 2016. Monthly and daily flow rates are presented in Appendix I.

Table 2-6 LFG Input to A-3 Flare

Emission Control Device	Average Flow (scfm)	Average CH ₄ (%)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heat Input (MMBtu)	Max Daily Heat Input (MMBtu)
A-3 Flare	1,331	51.22	344,577,628	176,624,892	178,921	1,170

(1) The methane content was determined from the March 5, 2015 and March 3, 2016 source tests.

2.12 COMPLIANCE WITH §60.757(F)(6)

"The date of installation and the location of each well or collection system expansion added pursuant to (a)(3), (b), (c)(4) of §60.755."

At the end of the reporting period, the GCCS consisted of thirty-eight (38) vertical LFG collection wells. No wells were added to or removed from the collection system during the reporting period.

2.13 COMPLIANCE WITH TITLE V PERMIT CONDITION 8366, PART 12

Title V Condition Number 8366, Part 12 requires annual monitoring for hydrogen sulfide using a Draeger tube. The 2015 Annual sample concentration was 70 ppm_v (collected September 10, 2015). Data from the monitoring event is presented in Appendix K.

2.14 COMPLIANCE WITH TITLE V PERMIT CONDITION 2593 FOR S-24

Daily records were maintained and totaled as required by Condition 2593 Part 4. Concrete accepted at S-24 did not exceed 150,000 tons during any consecutive 12-month period. Combined concrete and asphalt accepted and removed from the site did not exceed 2,500 tons in any day.

3 PERFORMANCE TEST REPORT

In accordance with BAAQMD Regulation 8-34-413 and 40 CFR §60.757(g) in the NSPS, a Performance Test Report is required to be submitted for subject facilities containing performance and monitoring data for the operation of the GCCS. The operational records listed in Table 3-1 have been reviewed, summarized, and are included in this Performance Test Report.

Table 3-1 Performance Test Requirements

RULE	REQUIREMENT	LOCATION IN REPORT
8-34-412, §60.8, §60.752(b)(2)(iii)(B), §60.754(d)	Compliance Demonstration Test	Section 3.1, Appendix L
§60.757(g)(1)	A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for future collection system expansion.	Section 3.2, Appendix A
§60.757(g)(2)	The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based.	Section 3.3
§60.757(g)(3)	The documentation of the presence of asbestos or non-degradable material for each area from which collection wells have been excluded based on the presence of asbestos or non-degradable material.	Section 3.4
§60.757(g)(4)	The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on non-productivity and the calculations of gas generation flow rate for each excluded area.	Section 3.5
§60.757(g)(5)	The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill.	Section 3.6
§60.757(g)(6)	The provisions for the control of off-site migration.	Section 3.7, Appendix J

3.1 FLARE COMPLIANCE DEMONSTRATION TEST RESULTS (BAAQMD 8-34-412)

The most recent A-3 Flare Annual Compliance Demonstration Test was conducted on March 3, 2016. The Source Test Report was submitted to the BAAQMD on April 12, 2016.

Table 3-3 shows the results of the A-3 2016 Flare Compliance Demonstration Test, averaged from three test runs. A summary of the results from the March 3, 2016 Compliance Demonstration Test in Appendix L.

Table 3-2 A-3 Flare Compliance Demonstration Test Results

Condition	Flare Average Results	Applicable Limit	Compliance Status
NO _x , lbs/MMBTU	0.04	< 0.06	In Compliance
CO, lbs/MMBTU	0.02	<0.30	In Compliance
NMOC (ppm _v @ 3% O ₂)	< 2.8	< 30	In Compliance

3.2 COMPLIANCE WITH §60.757(G)(1)

"A diagram of the collection system showing collection system positioning including wells, horizontal collectors..."

A map dated November 14, 2014 of the LFG collection system showing the positioning of all vertical wells, horizontal collectors, and other LFG extraction devices is included in Appendix A. No modifications to the collection system have been completed since the preparation of this map.

3.3 COMPLIANCE WITH §60.757(G)(2)

"The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based."

In general, the sufficient capacities of the GCCS components are based on establishing, maintaining, and documenting that the surface emissions of non-methane organic compounds (NMOCs) and subsurface LFG migration are controlled within compliance limits. Over the monitoring period covered by this Combined Report, the sufficiency of the GCCS components was based as follows:

- The existing GCCS has historically provided LFG wells and collectors spaced in accordance with standard industry practices. The installed collector density during the reporting period appears to be more than adequate for controlling surface emissions and subsurface LFG migration, based on continuous compliance and operational experience.
- The total capacity of the LFG mover equipment exceeds the current United States Environmental Protection Agency (USEPA) Model AP-42 projections of LFG generation and the historic LFG extraction rates determined to be continuously available from the landfill.

The landfill operator conducts routine monitoring in accordance with NSPS requirements. If the TCRDF GCCS does not meet the measures of performance set forth in the NSPS, the GCCS will be adjusted or modified, as required.

Demonstrating Compliance with §60.757(g)(2)

"The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based."

The Site is now closed; therefore peak generation has already occurred. LFG generation will decline over time. The existing GCCS conveyance piping has sufficient capacity to handle all current and future LFG flow rates based on well vacuum data, LFG generation estimates, and surface emissions monitoring.

Compliance with 40 CFR §60.757(g)(2) is demonstrated by performing SEM. Refer to Section 2.6, Surface Emissions Monitoring for information pertaining to the SEM results.

3.4 COMPLIANCE WITH §60.757(G)(3)

"The documentation of the presence of asbestos or non-degradable material for each area from which collection wells have been excluded based on the presence of asbestos or non-degradable material."

No segregated areas or accumulations of asbestos or non-degradable material are documented for the TCRDF in the GCCS Design Plan. Therefore, 40 CFR §60.757(g)(3) is not applicable.

3.5 COMPLIANCE WITH §60.757(G)(4)

"The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on non-productivity and the calculations of gas generation flow rate for each excluded area."

No non-productive areas have been excluded from the coverage of the GCCS. Therefore, 40 CFR §60.757(g)(4) is not applicable.

3.6 COMPLIANCE WITH §60.757(G)(5)

"The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill."

The present gas mover equipment capacity is adequate to move the current LFG flow rate. The current A-3 Flare has a capacity of 2,500 scfm at 50 percent methane. Since the Site is now closed, peak generation has already occurred; therefore the current equipment is capable of moving the maximum flow rate over the remaining life of the landfill.

3.7 COMPLIANCE WITH §60.757(G)(6)

"The provisions for the control of off-site migration."

There have been no significant LFG migration occurrences at the TCRDF. The most recent Perimeter Gas Migration Monitoring Plan (PGMMP) was updated in January 2012 to include a variance from probe monitoring requirements and recent changes to building monitoring locations. Buildings on-site at the TCRDF are monitored quarterly for LFG migration.

Quarterly Methane-In-Structure Monitoring occurred on the following dates:

- Fourth Quarter 2015 – November 9, 2015
- First Quarter 2016 – March 12, 2016

All in-structure locations were in compliance with no detections above the 1.25 percent methane limit. The Methane-In-Structure Survey Reports are included in Appendix J.

Demonstrating Compliance with §60.757(g)(6)

"The provisions for the control of off-site migration."

The landfill operator will continue monitoring in accordance with the existing plan as discussed above. If the GCCS at the TCRDF does not meet the measures of performance set forth in the NSPS, the GCCS will be adjusted or modified in accordance with the NSPS requirements.

4 STARTUP, SHUTDOWN, MALFUNCTION (SSM) REPORT

SSM Report for the GCCS at the Tri-Cities Recycling and Disposal Facility

The NESHAP contained in 40 CFR Part 63, AAAA for MSW landfills to control hazardous air pollutants include the regulatory requirements for submittal of a semi-annual report (under 40 CFR 63.10(d)(5) of the general provisions) if an SSM event occurred during the reporting period. The reports required by 40 CFR §63.1980(a) of the NESHAP and 40 CFR §60.757(f) of the NSPS summarize the GCCS exceedances. These two semi-annual reports contain similar information and have been combined as allowed by 40 CFR §63.10(d)(5)(i) of the General Provisions.

NESHAP 40 CFR Part 63, AAAA became effective on January 16, 2004. Those SSM events that occurred during the NSPS semi-annual reporting period (November 1, 2015 to April 30, 2016) are reported in this section. The following information is included as required:

- During the reporting period, 20 flare SSM events occurred. The cause, time and duration of each event are presented in the Flare SSM Log, which is contained in Appendix B.
- During the reporting period, 0 wellfield SSM events occurred to allow for active filling, repairs, and well raising. The time and duration of each event are presented in the Wellfield SSM Log, which is contained in Appendix C.
- During the reporting period, 0 recorder SSM events occurred.
- In all, 20 events were consistent with the standard operating procedures contained in the SSM Plan.
- No exceedances of any applicable emission limitation in the landfill's NESHAP (63.10(d)(5)(i)) occurred.
- Revisions of the SSM Plan to correct deficiencies in the landfill operations or procedures were neither required, nor prepared (§63.6(e)(3)(viii)).